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ILLINOIS COMMERCE COMMISSION

Illinois Commerce Commission On its Own Motion	))	
Investigation concerning Illinois Bell Telephone Company's compliance with Section 271 (c) of the Telecommunications Act of 1996.	)	No. 96-0404

SUPPLEMENTAL TESTIMONY

OF

TIMOTHY M. CONNOLLY

ON BEHALF OF

AT&T COMMUNICATIONS OF ILLINOIS, INC.

AT&T EXHIBIT 4.1

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. Timothy M. Connolly. My business address is 50 Fremont Street, Suite 320, San Francisco, California 94105.

Q. DID YOU PREVIOUSLY FILE TESTIMONY IN THIS PROCEEDING?

A. Yes. On November 8, 1996, I filed direct testimony in this case which addressed Ameritech's proposals for access to Ameritech's operations support systems ("OSS") and interfaces.

Q. WHAT IS THE PURPOSE OF THIS SUPPLEMENTAL TESTIMONY?

A. The purpose of this supplemental testimony is to respond to the Rebuttal and Supplemental Rebuttal testimony of Ameritech witnesses Mickens and Rogers and to provide testimony regarding my continuing analyses and assessment of Ameritech's proposed operations support systems and system interfaces. I have reviewed Ameritech's testimony applying the knowledge and experiences I have had with information technology within the telecommunications industry. Based on my analysis of Ameritech's OSS interfaces, I conclude that the interfaces are not yet operational and, at present, fall woefully short of providing a reasonable degree of operational support for AT&T's entrance into the local service market.

My testimony will be presented in three parts. After some introductory comments, I will address the following:

First, I explain why, contrary to Ameritech's assertions, CLEC development of fully functioning operations support systems which are LEC complements is an extremely difficult and time-consuming task. Not only must the incumbent's processes and systems be thoroughly reviewed and understood, but the competitor must develop its own processes and systems that will allow it to accurately and efficiently communicate with the systems utilized by the incumbent.

Second, I update my prior testimony with additional information on the results of AT&T's service readiness field testing to date. As I will discuss in more detail, this testing experience conclusively proves that Ameritech's systems are not currently in a state of operational readiness.

Finally, I will comment specifically on assertions made by Mr. Mickens' and Mr. Rogers' in their rebuttal and supplemental testimony.

INTRODUCTORY COMMENTS

Q. ARE AMERITECH'S OPERATIONS SUPPORT SYSTEMS CURRENTLY IN A STATE OF OPERATIONAL READINESS?

A. No. For competition to emerge, the operations support systems and interfaces offered by the incumbent must support new customer acquisition and the provisioning and maintenance of new customer service. Given the present status of Ameritech's OSS interfaces, new entrants are six to twelve months from being able to effectively compete with Ameritech in the local market. I base this opinion on the limited capabilities of Ameritech's current support systems and interfaces as well as the amount of work that will be necessary to move these to a state of operational readiness.

Q. WHAT DO YOU MEAN BY THE PHRASE "OPERATIONAL READINESS?"

A. Operational readiness is the state of systems and support operations that is achieved after those systems are providing useful results according to design. An interface to a system is operationally ready when it works satisfactorily with the underlying systems on both sides of the interface. It must deliver service.

Operationally ready systems have been tested by systems developers and end-users under testing criteria that are pre-defined to demonstrate market conditions.

As to ILEC systems and interfaces, operational readiness cannot be unilaterally declared by the ILEC since the ILEC is but one of the system users. Both users must concur that the systems are ready.

Q. AMERITECH REPRESENTS THAT THE PARTIES HAVE BEEN WORKING FOR MONTHS TOWARD THE OPERATIONAL READINESS OF AMERITECH'S SUPPORT SYSTEMS AND INTERFACES. PLEASE COMMENT.

A. There has been substantial testimony regarding the efforts of the various parties to achieve operational and capacity readiness. However, that should not be the primary focus of the inquiry. The important question for the purposes of Section 271 is whether Ameritech's systems and those of the competitive local exchange carriers ("CLECs") actually work together to provide operational parity to new entrants and high quality service to customers. That test plainly has not yet been met by Ameritech.

Although Ameritech alleges it has been fully cooperating with AT&T in an attempt to ready its OSS and interfaces, there have been difficulties. Later, I will discuss some of the problems AT&T encountered in its attempts to review and test Ameritech's systems and procedures.

THE DEVELOPMENT OF A FULLY-FUNCTIONING OPERATIONS SUPPORT SYSTEM

Q. PLEASE EXPLAIN BRIEFLY WHAT EFFORTS ARE INVOLVED IN MAKING AN INCUMBENT'S AND A CLEC'S SYSTEMS "WORK TOGETHER."

A. Ameritech witnesses suggest that the process of developing compatible operations support systems and effective interfaces involves only a simple sharing of specification information. This is not true. To the contrary, the process is both extremely complex and very time-consuming. For each interface, three critical elements must be considered: the ILEC "side" of the interface; the CLEC "side" of the interface; and the actual interface, which are the system specifications that allow the two sides to effectively communicate. It is through the interface that the two sides are integrated, tested and deployed.

To assist in my explanation of this process, I have attached as Exhibit TMC-01 an illustration of the components of an operational support system. As can be seen from the exhibit, AT&T's internal systems must communicate with Ameritech's internal systems through operations support system interfaces for each of the relevant functions.

Q. EXPLAIN WHAT YOU MEAN BY THE AMERITECH "SIDE" OF THE INTERFACE.

A. The Ameritech "side" of the interface refers to all the operations and systems that Ameritech uses to develop and process its own as well as CLEC transactions. The left side of Exhibit TMC-01 identifies the tasks related to the Ameritech operations support systems, interfaces and related databases needed for interactions with CLECs. The systems have been developed consistent with the Ameritech interface specifications, as adapted to meet the industry standards for transactions and data definitions. Importantly, the systems embody Ameritech's business rules.

Q. WHAT DO YOU MEAN BY THE AT&T "SIDE" OF THE INTERFACE?

A. The AT&T "side" of the interface is the CLEC complement to the Ameritech side. AT&T must develop capabilities through its own systems that allow it to electronically forward transactions to Ameritech for processing, interpret Ameritech's responses and maintain customer and business data. AT&T must establish its systems in concert with the interface specifications and the AT&T business rules that have been established.

In order to have transactions processed in Ameritech's systems, AT&T must consider and adhere to Ameritech business rules and procedures. These business rules are the amalgamation of Ameritech's standards, tariff interpretations,

competitive policies, methods and procedures and unique system design parameters. For instance, a CLEC must know whether Ameritech's business rules allow order numbers to be duplicated, require information on the customer's PIC and/or require a specific format for directory listings. Only when a service order is issued using this set of Ameritech-mandated processes, all of which are within Ameritech's exclusive control, will the service order be completed in Ameritech's systems as requested and as promised to the customer. At the time of the development of AT&T's systems, AT&T did not have access to Ameritech's business rules because those were not spelled out as such in the interface specifications.

Q. ARE AMERITECH'S BUSINESS RULES AND PROCEDURES THE SAME AS THOSE USED BY AT&T?

A. No. AT&T and Ameritech may have different views on issues that relate to order numbers, PIC contents, USOC relationships, etc. If AT&T's rules are not synchronized with Ameritech's, the service requests will not be successfully processed in Ameritech's systems. Manual intervention and correction of error conditions would gradually increase the success rate but would not assure timely processing of the transactions and would likely create quality and consistency issues.

The recent service readiness testing ("SRT") of the resale ordering interface bears this out. As will be discussed in more detail below, many of the orders submitted by AT&T were rejected by Ameritech's systems because they were formatted using AT&T's business rules, not Ameritech's, because AT&T did not have access to the Ameritech business rules. And although AT&T is learning Ameritech's business rules and, through trial and error, incorporating some of them into its processes and procedures, this process is proving to be an extremely time-consuming process.

Q. WHY IS THIS PROCESS SO COMPLEX IF, AS AMERITECH ALLEGES, THE AMERITECH INTERFACES ARE CONSISTENT WITH INDUSTRY STANDARDS?

A. The process is complex because, even when there is adherence to industry standards, that adherence does not necessarily ensure compatibility between the CLEC and ILEC systems. The standard guidelines for the industry, which were developed by the Ordering and Billing Forum (OBF), Bellcore and the Telecommunications Industry Forum, are very loosely defined to allow flexibility in the design of industry systems. Therefore, although Ameritech claims that its specifications are consistent with industry standards, the practical significance of that consistency has been and continues to be limited. Indeed, the single most significant problem AT&T and Ameritech have encountered while attempting to

deploy support systems is that Ameritech has unique operational support systems which compel unique OSS specifications. AT&T has been required to identify , through trial and error, Ameritech's unique system parameters and design its complementary systems and its side of the interface to meet the unique Ameritech standards.

Q. HAS THE ABSENCE OF COMPREHENSIVE INDUSTRY STANDARDS MADE IT DIFFICULT FOR THE PARTIES TO DEVELOP EFFICIENT OSS INTERFACES?

A. Yes. AT&T is working with each of the RBOCs across the country to develop OSS interfaces to accommodate differences in each system. Ameritech and the other RBOCs are, in turn, required to work with numerous interexchange carriers to develop the various forms of electronic interfaces. Consequently, the lack of clear, firmly established national guidelines makes this a highly complicated and extremely challenging undertaking for all parties involved, even under the best of circumstances.

Q. HAS AMERITECH CHANGED ITS SPECIFICATIONS OVER TIME?

A. Yes. Since April, 1996, Ameritech has published interface specifications for ordering resale services on four separate occasions. The specifications are not yet finalized for any of the operational functions (pre-ordering, ordering, provisioning, maintenance and repair, and billing), and continue to be developed

and enhanced to provide the operationally reliable interfaces necessary for a new entrant to enter the market on a commercially viable basis.

Ameritech issued the latest version of its resale provisioning and ordering specifications on November 8, 1996. These new specifications failed to highlight changes from the previous versions, which meant that AT&T was required to make a line-by-line comparison to identify the differences. As recently as December 18, 1996, AT&T met with Ameritech to discuss a series of questions and concerns which must be addressed. At that meeting, Ameritech agreed to draft additions to its ordering specifications for POTS resale in early January and presumably will follow-up at a later date with interface specification enhancements to address other types of resold services. AT&T and other CLECs that have developed ordering systems will be required to conform their systems to the specification revisions as they are released and made effective by Ameritech.

The resale ordering specifications have undergone the most scrutiny and analysis, but are still being updated. The specifications for other interfaces are in an even more preliminary state. Contrary to Mr. Rogers testimony, Ameritech's resale pre-ordering specifications remain too undefined to allow AT&T to build effective systems. Those specifications continue to limit AT&T's ability to build effective interactive systems. For instance, the Due Date Interface (Version 3.0) expressly states that its uses are limited:

> "The initial version of the Due Date interface focuses primarily on residential and business access lines. This includes: residential and small business type accounts for a subset of all service order types and a subset of the Ameritech products and services (USOCs). All service order due dates are subject to the current minimum lead times." (Emphasis added).

Q. DO AMERITECH'S SPECIFICATIONS DEVIATE FROM THE STANDARDS USED BY THE OTHER INCUMBENTS?

A. I do not have access to all of the RBOC interface specifications but I have had access to some of them. My findings are that, because the standards today are very loosely defined, each deviates somewhat from the others.[1] The non-standardization of the other interfaces (pre-ordering, ordering, provisioning, repair and maintenance and the other components of billing) is not unexpected. The RBOCs and other ILECs all use unique interfaces to create or provide transactions that comply with their own internal systems.

Q. IS IT NOT REASONABLE THAT AMERITECH HAS HAD DIFFICULTIES IN PROVIDING DETAILED SPECIFICATIONS FOR ANY AND ALL CLEC'S TO INTERACT WITH ITS OPERATIONS SUPPORT SYSTEMS?

[1] The one exception to this rule is Bellcore's Exchange Message Record (EMR) interface. Because this type of transaction has been exchanged among carriers for the longest period of time, it is the most fully developed interface.

A. Reasonable, yes; acceptable, no. A competitive marketplace requires an effective resale environment. The CLECs therefore have no real alternative to relying on Ameritech's OSSs and the interfaces into and from these systems. If Ameritech cannot define the means by which competitors will be able to effectively use the information systems resources that comprise the operational characteristics of the local market, the market cannot become competitive.

Q. HAS AMERITECH'S ADHERENCE TO UNIQUE STANDARDS CREATED ADDITIONAL PROBLEMS BETWEEN THE PARTIES?

A. Yes. First, Ameritech insists on adhering to EDI Version 5.0 in its definition of its ordering interface when the other Regional Bell Operating Companies ("RBOCs") and the rest of the telecommunications industry is deploying ordering interfaces at the EDI Version 6.0 level. To ensure that it could timely enter the local services market in Illinois, AT&T was required to create additional computer system features to translate its ordering transactions to the earlier, Version 5.0 standard.

There are also provisions in Ameritech's ESO Guideline (Version 3.0, November 8, 1996 "to be effective January 6, 1997") which identify numerous areas in which the industry standards are essentially over-ridden by Ameritech-adopted conventions. For instance, contrary to all other ILEC requirements, Ameritech's specifications for 850 transactions for reseller contact name and telephone number

notes that, while this segment is optional in TCIF documentation, it is mandatory for Ameritech orders. Thus, failure to place an entry in this field will cause an Ameritech rejection.

Q. HAS THIS LACK OF CLEAR STANDARDS CREATED PROBLEMS IN THE DEVELOPMENT AND TESTING OF THE INTERFACES?

A. Yes, largely because Ameritech has been inflexible in its demands and unwilling to share its business rules. A good example of this is in the area of processing changes to previously issued purchase orders. Under the EDI standards, changes to previously issued purchase orders are made via an "860 transaction." However, the 860 transaction has been interpreted differently by AT&T and Ameritech. Ameritech's design for processing 860 transactions requires that an 860 be used to update or change the underlying purchase order (an "850 transaction") that is already in queue. Thus, when the Ameritech system receives an 860, it looks for the predecessor 850 and relies on the change order to effect the changes in the original purchase order transaction.

AT&T designed its systems to restate the entire order when a customer requests a change prior to completion of the original order. This procedure requires the 860 to find the underlying 850 and "refresh" its contents completely. Therefore, at any time, the AT&T version of the 860 transaction will show all of the newest and most current customer requests, irrespective of the content of the original order.

Although both of these design approaches are technically consistent with the EDI standards, they are, in fact, very different. These differences have already caused problems across the interface. AT&T sent 860s to Ameritech believing that Ameritech's systems would "refresh" the underlying 850. But when Ameritech's system received the 860, instead of updating the underlying 850, the 860 was rejected.

Q. WHY DID AT&T'S DESIGN CONFLICT WITH AMERITECH'S?

A. AT&T did not have access to the Ameritech business rules which would have allowed AT&T the opportunity to design its 860 transaction in a manner that complements Ameritech's processing. In fact, the systems design approaches were not shared until after the first 860 was sent to Ameritech -- too late for simple design changes to be made. Because this problem was not encountered until the testing phase, I believe other 850/860 types of translation problems may yet to be encountered. As testing continues, other CLEC versus ILEC design inconsistencies may be revealed. These concerns go beyond just ordering, but go to technical issues like number portability, 911 services, directory assistance and other areas of information exchange that are not currently being tested to the same extent as the OSS interfaces.

More importantly, these problems cannot be anticipated in advance. Ameritech is still unwilling to share its business rules and because CLECs have no bargaining power or leverage in this relationship, they cannot force Ameritech to cooperate. Thus, design problems must simply be encountered, by trial and error in the testing phase, and then work-arounds must be developed. This approach will require AT&T to expend substantial additional time and cost in its efforts to perfect the interfaces.

STEPS THAT A NEW COMPETITOR MUST TAKE IN ORDER TO IMPLEMENT EFFECTIVE OPERATIONS SUPPORT SYSTEMS

Q. GIVEN THE LACK OF INDUSTRY-WIDE STANDARDS, WHAT MUST A NEW COMPETITOR DO TO IMPLEMENT OPERATIONS SUPPORT SYSTEMS CAPABILITIES THAT COMPLEMENT ILEC SYSTEMS?

A. The "interface" is the nexus between the two separate "sides" of an operations support system. Specification documents, like those recently published by Ameritech, attempt to define the inputs and outputs that will allow the systems of two entities to communicate with each other. Once the inputs and outputs are defined through the specifications, the CLEC must undertake comprehensive systems analysis activities in an effort to modify its own OSS capabilities to

complement the incumbent's systems. These analysis activities usually occur in six steps: systems analysis; specification refinement; system design; system development; testing and training; and implementation.

Q. PLEASE DESCRIBE THESE SIX STEPS IN GREATER DETAIL.

A. Systems Analysis: The first step is systems analysis. In this step, the goals are analyzed so the specific processing needs can be laid out in broad measure. Determinations of the business functions that the system must address are made as well as preliminary decisions as to which are to be computerized and which will be manual processes. These systems analysis activities also involve the CLEC "business organizations" which address the processing needs of the business. The analysis of the overall systems and the business needs cause questions to be raised on what data definitions apply, the conditions under which information is required or optional, and whether information must be obtained from data bases, supplied by customers, validated or accepted as is. Hundreds of questions are the norm, not the exception. These questions are reviewed with the suppliers of the input and output transactions.

Specification Refinement: The systems analysis step is followed by a specification refinement activity. In this activity, the details and definitions of data elements, records and data bases are actually updated, recognizing that the initial specifications were not universally understood. This is the step that

Ameritech agreed to undertake after the December 18 meeting with AT&T, at which time AT&T's questions and Ameritech's answers pointed out that additional definition and specifications were required. Specification refinement can take several iterations before the parties find that all questions are resolved and no further definition is required.

System Design: Next comes the system design phase. The design effort takes into consideration the technical environment for the system, the various regional or local exceptions, the daily/weekly/monthly processing issues to be addressed and more. The system will be broken down into modules that are logical components for computer processing or manual methods and procedures development.

System Development: Once the system is designed, the systems development (i.e., programming) efforts are begun. Systems development is where programmers and data base developers get to work coding the modules. The manual activities are also developed which require procedures analysts to work with job or task designers to place the manual activities into logical sequences. These efforts also result in the design of forms, screens and reports. The merging of computerized modules and manual procedures are then followed by testing that is best accomplished through a structured manner and discipline.

Testing: As I stated in my direct testimony, testing is the exercise that bears out the design and programming. Testing must separately validate the construction and development of the individual modules, the programs which comprise many modules, the systems that comprise many programs and, on an integrated basis, all of the components, both computerized and manual, under a variety of conditions. Testing demonstrates both that the system components perform according to the design of what should happen, but it also serves to demonstrate capacities or constraints in terms of volumes, seasonal differences, special processing periods and the like.

When systems are developed for the purpose of working with other systems, which is exactly the case for ILEC and CLEC systems and the interfaces which connect them, the complementary systems must also be tested in a joint manner. This is frequently referred to as end-to-end, or full integration testing. This is the opportunity for the entire spectrum of testing to be accomplished in an environment that is "safe" from customer consequence. These tests should demonstrate the thoroughness of both organizations in their individual test conditions, as it is important that tests and test results be shared with the other organization.

Q. ONCE THE SYSTEMS ARE PROPERLY TESTED, ARE THE INTERFACES OPERATIONALLY READY?

A. No. Testing must be accompanied by sufficient training to be certain that staff knows how to operate the systems and to interact with the screens and forms. Accommodations must also be made for administrative functions -- i.e., the data bases must be backed up appropriately in the normal course of operations.

Once all these preliminary steps have been taken, the system can move into the implementation phase. This phase is less complicated for a newly-constructed system than it is for a system replacement. The process of converting data bases from one system to another is indicative of the types of additional complications that can arise during the implementation phase for replacement systems.

Q. WHAT PROPORTIONS OF A TYPICAL SYSTEMS DEVELOPMENT EFFORT WOULD EACH OF THE WORK ACTIVITIES ENCOMPASS?

A. Generally speaking, a full systems effort, consistent with the scope of work involved in developing CLEC interfacing systems, would encompass relative proportions of the work activities according to the following schedule:

PHASE OF DEVELOPMENT	TOTAL TIME ALLOTTED
Systems analysis	10 %
Specification refinement	3 %
Systems design	10 %
Systems development	25 %
Testing/training	50 %
Implementation of a new system	2 %
	100%

These are general guidelines, based on my experiences with large system undertakings during my career. These are consistent with the nature of the work facing CLECs in developing their companion operations support systems and the interfacing capabilities necessary to effectively interconnect with ILEC systems.

Q. DO ILECS FACE SIMILAR CHALLENGES IN ENGINEERING THEIR SYSTEMS?

A. As I mentioned, the above example shows the typical task breakdown that most companies would utilize in developing and implementing systems. If an ILEC were to develop new systems to support resale of local services or unbundled network elements, it would face substantially the same challenges as those confronting CLECs.

In some cases, however, the ILECs have had operations support systems in place for many years. They are therefore able to move more quickly than the CLECs in the development of their systems, particularly in light of their experience and previous investments in systems that share transactions across OSS interfaces. For instance, Ameritech Illinois witnesses have testified that some of its operations support systems have been used to support access services and local exchange services for many years. However, when these systems are used for purposes other than those intended in the original design -- i.e., to support other markets and new user clients -- the ILEC systems may need to be modified and/or refined and then tested to meet the new needs.

Q. YOU SEEM TO PLACE A HEAVY EMPHASIS ON TESTING. WHAT GIVES TESTING SUCH IMPORTANCE IN YOUR RECOMMENDED SYSTEMS DEVELOPMENT CYCLE?

A. In the development of operations support systems and interfaces that will complement existing ILEC systems, CLECs are required to work within a compressed systems cycle. Because the conceptual design of the system is already in place, and because initial specifications are provided, the overall design cycle is shortened. But the CLECs must be assured that individual modules work within programs, that the programs work together in concert with the system design, and that transactions are processed in accordance with the design and